

Thesis of Doctor Degree

**Study on Relationship between Chiropractic Care and Manual
Therapy in General Clinics**

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Study on Relationship between Chiropractic Care and Manual Therapy in General Clinics

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**The Graduate School of
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Abstract

This study had conducted a questionnaire survey with 337 patients, who experienced chiropractic treatment for the body adjustment in a hospital in 2014, Japan, in order to look into the effects of the treatment in terms of pains and their satisfaction with the effects of the body adjustment therapy.

As a result, headache, migraine, and the pains in the neck, the chest, the back, the low back, the hips, and the legs were alleviated after the chiropractic based body adjustment treatment ($p<0.001$). Side effects were low after the body adjustment, and satisfaction was very high. Also, the intention of recommending the chiropractic based body adjustment was very high.

Key Words: Body Adjustment, Chiropractic, Satisfaction, Recommendation Intention

I. Introduction

1. Research Purpose and Necessity

Unlike the lifestyle in the past, the present lifestyle is based on the use of chairs. In particular, wrong postures taken not only at work, but in daily life lead into rises in pains and relevant disorders.

The balance of the body is not made by one organ, but by the complicated mutual harmony of the system of sensory nerves including visual sense, vestibular sense, and proprioceptive sense and of the motor nerve system controlling muscular strength and response speed. Therefore, in a wide range of the body structure, various types of imbalance in the body and body balance disorders, such as the damage to vestibular organs including the internal ear, peripheral nerve damage by degenerative diseases or diabetes, and the damage to the sensory integration function of the central nerve system by various brain diseases, can occur (Sturnieks, 2008; Chang et al., 2013).

To adjust the imbalance of the body, the balance adjustment is required. It begins from the body alignment. In other words, by applying the concept of the body mechanics to the alignment of muscle and skeletal system, it is possible to make to strike a balance for 'static alignment' and 'dynamic alignment', the relative positions of the body regions just as the position of the head to the shoulders (Soderberg et al., 1978)

As the methods of the body adjustment, there are motion based therapies including pilates, dancing, yoga, and gymnastics, and medical therapies including surgical operation, Chuna treatment, medicine treatment, and electrical stimulation, and medical aids based therapies.

One of the medical therapies, chiropractic is used to find the displaced spine and

pelvis to adjust the pelvis segments and improve the normal pyramidal workability; to convey the commands of the central nerve system to the effectively relevant organ via the efferent system, the functional low system of peripheral nerves to adjust the displaced spine and pelvis and remove pressure of nerves; and thereby to exert the body's innate intelligence of curing through the normal activity of efferent nerves (Lee, 2007).

In particular, chiropractic has the strong medical concept by focusing on prevention and the optimal health conditions and on all nerves, muscles, and skeletal structures in consideration of nutrition and exercise. Therefore, it is very helpful to enhance kinetical functions of the body.

Accordingly, this study was aimed at conducting a questionnaire survey with the patients who experienced the body adjustment treatment based on chiropractic and finding their pain characteristics and satisfaction after the application to chiropractic to each body region.

Also, it tried to provide a fundamental material to apply chiropractic to the body adjustment of those who suffer the low back pain and musculoskeletal disorders.

II. Theoretical Background

1. Body Balance

Human posture means standing, sitting, lying, and standing upright against gravity, and anatomical position represents the position of the human body, standing erect, with the face directed anteriorly, the upper limbs at the sides and the palms turned anteriorly (supinated), and the feet pointed anteriorly. To take a good posture, it is required to stand, walk, sit, and lie down in the position of giving less burden to muscles and ligaments, and to align bones and joints rightly to use muscles properly in motion and weight loading activity. Such a posture can prevent spinal misalignment caused by wrong posture (Yang, 2008; Kim et al., 2014).

In short, maintaining the body balance is of very significance. Balancing is the ability to maintaining the center of gravity on the base of support in a given environment. To keep the body balance properly, it is necessary to recognize circumstances accurately and set up right strategies to respond to them (Leboeuf et al., 2005).

The balance of the body is not made by one organ, but by the complicated mutual harmony of the system of sensory nerves including visual sense, vestibular sense, and proprioceptive sense and of the motor nerve system controlling muscular strength and response speed. Balance is biomechanically important, and is influenced by the size and quality of the base of support, Range of Motion (ROM) of joints, muscles, and somesthesia. The balanced control is referred to as the stabilization at the center of the body, achieved by controlling the body stability and tension against internal and external circumstances, such as gravity, base of support, and visual sensation, with the interaction of diverse sensorimotor nerves (Cho, 2002).

Therefore, to minimize the loads imposed to the spine by gravity in daily life or in

exercise, it is very important to take an ideal posture of aligning spinal bones and create the optimal conditions to help all body muscles and organs to do activity smoothly (Song et al., 2012)

2. Chiropractic

Chiropractic is a natural therapy with no use of medicine and surgical operation. As a sort of science, it focuses on the whole body to find a fundamental cause and accomplish adjustment, rather than emphasizing symptom adjustment methods.

Historically, chiropractic was first introduced 110 years ago in 1896 by American Dr. David Palmer, who began with the theory according to which subluxation or vertebral dislocation can impede action of the nerve system and the human have the innate ability to heal the disorder on their own. Since the academic system, educational development, and research achievement of chiropractic, it has been placed as the most growing alternative medical science in as many as 60 countries over the last 25 years (Jang, 2010).

In particular, chiropractic emphasizes that the subject of the adjustment therapy is not an operator, but a patient's own body. Its focus on the function of a patient is not different from the philosophy pursued by alternative medical science. The excellent theoretical ground of chiropractic is that since the nerve system is developed well in the human body, it can affect other systems in the body and thereby play a critical role for health and diseases of the human body. The unchanging basic theory of chiropractic is that deviation of the musculoskeletal system influences the function of the nerve system and health of the human body (Thomas, 1993). For the reason, it is reasonable to approach chiropractic as the medical concept of focusing on prevention and the optimal health conditions and treating muscles, nerves, and skeletal structures through nutrition and exercise.

Chiropractic technique can be classified into sacral occipital technique, activator methods technique, Tompson technique, and Gonsted technique.

Sacral Occipital technique, developed by Dr. Dejarnette, applies the primary laryngeal sacral respiratory mechanism to biomechanics. Based on the research on micro movement of cranial joints known as immovable joints, the technique uses the respiratory relationship with sacrum to treat the body imbalance. As a technique to supplement the clinical limit of chiropractic, it is based on the cerebral nerve control medical science. Since the technique applies softer musculoskeletal relaxation method than thrust adjustment, children, the old and weak, and pregnant women can feel a sense of resistance against the adjustment treatment. However, depending on symptoms, it is a very useful technique to people to whom thrust adjustment method pose a risk.

Activator Methods technique is used to present the displacement direction with the short and long legs changed by the sensitivity reflection of the muscular nerve system. It requires a unique movement to find the location of the displaced centrum, and applies Isolation Test and Short and Long Leg Test to find the regions for treatment. Activator Gun, 60 times faster than manual thrust and 30 times faster than Toggle Recoil Technique, helps an operator to easily treat all centra without exhaustion of physical strength.

Tompson technique developed by Dr. Cleay Tompson uses Newton's First Law related to the gravitation force and the natural force.

Gonsted technique created by Dr. Clarences. Gonsted (1898~1978) is the technique being used most in countries theses days. It is the basis of chiropractic adjustment with rotational thrust.

III. Research Method

1. Study Subjects

From Feb. 15 to Apr. 15, 2014, this study had conducted a questionnaire survey with 337 patients, who experienced chiropractic treatment for the body adjustment in a hospital in 2014, Japan, in order to look into their satisfaction with the effects of the body adjustment therapy. The questionnaire copies with insincere answers and no answers were excluded from the collected questionnaire ones. As a result, a total of 286 copies were used for the final analysis.

2. Questionnaire

The study subjects were Japanese. Therefore, the questionnaire was first written in Korean, and then was translated into Japanese.

The questionnaire is categorized into four parts: general characteristics, types of body adjustment, pain alleviation before and after chiropractic operation, and the satisfaction after the performance of chiropractic adjustment therapy.

3. Statistical Analysis

The statistical analysis methods used in this study are presented as follows:

First, frequency analysis with n and % was conducted to investigate the general characteristics of the study subjects, types of body adjustment, and their satisfaction with chiropractic adjustment after the performance of the therapy. And cross tabulation analysis was conducted to compare pain characteristics before and after body adjustment and the satisfaction after the performance of chiropractic adjustment therapy. The

statistics program used in this study was SPSS 18.0.

IV. Study Results

1. General Characteristics

The general characteristics of the study subjects are presented in Table 1. More specifically, regarding gender, female subjects (183, 64.0%) outnumbered male subjects (103, 36.0%). With regard to age, the study subjects aged less than 30 numbered 48 (16.8%); those aged between 31 and 40 numbered 67 (23.4%); those aged between 41 and 50 numbered 76 (26.6%); those aged between 51 and 60 numbered 45 (15.7%); those aged over 61 numbered 50 (17.5%). Regarding the mean height, the largest number of the subjects (146, 51.0%) had less than 160cm. Regarding weight, the largest number of the subjects (100, 35.0%) had between 51kg and 60kg. With regard to marriage, 109 were unmarried (38.1%), and 177 (61.9%) were married.

Table 1. General Characteristics of the Study Subjects

General Characteristics		n	%
Gender	Male	103	36.0
	Female	183	64.0
Age	Less than 30	48	16.8
	Between 31 and 40	67	23.4
	Between 41 and 50	76	26.6
	Between 51 and 60	45	15.7
	More than 61	50	17.5
Height	Less than 160cm	146	51.0
	Between 161cm and 170cm	91	31.8
	More than 171cm	49	17.1
Weight	Less than 50kg	79	27.6
	Between 51kg and 60kg	100	35.0
	Between 61kg and 70kg	63	22.0
	More than 71kg	44	15.4
Marriage	Unmarried	109	38.1
	Married	177	61.9

Total	286	100.0
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2. Types of Body Adjustment

The body adjustment types of the study subjects are presented in Table 2. Regarding the body type they think of themselves as, obese type numbered 130 (45.5%), standard type numbered 109 (38.1%), and thin type numbered 47 (16.4%). With regard to the reason of the body adjustment based on chiropractic, 188 (65.7%) replied ‘Because of the pain in a particular body region’, and 98 (34.3%) replied, ‘Because of the unbalanced left and right sides of the body’. With the body region that they most suffered or had something abnormal in, ‘around the low back’ numbered 108 (37.8%), ‘around the head and the neck’ numbered 79 (27.6%), ‘around the pelvis and the legs’ numbered 34 (11.9%), and around the shoulders and the arms numbered (11.2%). Regarding the cause of the body abnormality or posture imbalance, 190 respondents (66.4%) chose bad life habits. Regarding a period of perception of the symptoms, 190 respondents (66.4%) chose more than three years.

Table 2. Types of Body Adjustment

Types of Body Adjustment		n	%
Body Type Perceived	Obese Type	130	45.5
	Standard Type	109	38.1
	Thin Type	47	16.4
Reason of Body Adjustment	A Pain in a Particular Body Region	188	65.7
	Unbalanced Left and Right Sides of the Body	98	34.3
Painful or Abnormal Body Region	Around the Head and the Neck	79	27.6
	Around the Chest and the Back	20	7.0
	Around the Low Back	108	37.8
	Around the Shoulders and the Arms	32	11.2
	Around the Pelvis and the Legs	34	11.9
	The Whole Body	13	4.5

Cause of Pain and Abnormality	Bad Life Habits	190	66.4
	Occupation	55	19.2
	Obesity	3	1.0
	Feeble Constitution	4	1.4
	Not Recognized	34	11.9
A Period of Perception of Pain and Abnormality	3 months	18	6.3
	6 months	18	6.3
	1 year	31	10.8
	2 years	29	10.1
	3 years	190	66.4
Total		286	100.0

3. Comparison of Pain Characteristics Before and After Body Adjustment Based on Chiropractic

Pain characteristics compared before and after body adjustment based on chiropractic are presented in Table 3-Table 11.

Regarding to the subjects who experienced headache and migraine, 70 (42.2%) had the symptom before the chiropractic based body adjustment, but 96 (57.8%) replied that they had no symptom after body adjustment ($\chi^2=25.802$, $p<0.001$). With regard to a pain or stiffness in the neck, 117 had the symptom (49.4%) before the adjustment, and 120 (50.6%) had no symptom after the adjustment ($\chi^2=15.832$, $p<0.001$). Regarding a pain or a pressure in the chest and the back, 46 (41.4%) had the symptom before the adjustment, and 65 (58.6%) had no symptom after the adjustment ($\chi^2=32.819$, $p<0.001$). Regarding to a pain or impaired mobility in the low back, 100 (43.5%) had the symptom before the adjustment, and 130 (56.5%) had no symptom after the adjustment ($\chi^2=34.269$, $p<0.001$). Regarding a pain or impaired mobility in the hips, 31 (35.6%) had the symptom before the adjustment, and 56 (64.4%) had no symptom after the adjustment ($\chi^2=75.180$, $p<0.001$). Regarding a sense of numbness in the legs, 38 (41.3%) had the symptom before the adjustment, and 54 (58.7%) had no symptom after

the adjustment ($\chi^2=80.326$, $p<0.001$). Therefore, the symptoms didn't appear more after the body adjustment than before the body adjustment. Statistically there were significant differences.

Table 3. Experience of Headache and Migraine

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience Headache or Migraine	Yes	70(42.2)	96(57.8)	166(100.0)	25.802***
	No	17(14.2)	103(85.8)	120(100.0)	
Total		87(30.4)	199(69.6)	286(100.0)	

Chi-Square Test, *** $p<0.001$.

Table 4. Experience of a Pain or Stiffness in the Neck

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or Stiffness in the Neck	Yes	117(49.4)	120(50.6)	237(100.0)	15.832***
	No	9(18.4)	40(81.6)	49(100.0)	
Total		126(44.1)	160(55.9)	286(100.0)	

Chi-Square Test, *** $p<0.001$.

Table 5. Experience of a Pain or a Pressure in the Chest and the Back.

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or a Pressure in the Chest and the Back	Yes	46(41.4)	65(58.6)	111(100.0)	32.819***
	No	21(12.0)	154(88.0)	175(100.0)	
Total		67(23.4)	219(76.6)	286(100.0)	

Chi-Square Test, *** $p<0.001$.

Table 6. Experience of a Pain or a Pressure in the Shoulders

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or a Pressure in the Shoulders	Yes	123(53.7)	106(46.3)	229(100.0)	26.410***
	No	9(15.8)	48(84.2)	57(100.0)	
Total		132(46.2)	154(53.8)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

Table 7. Experience of a Pain or Stiffness in the Arms, the Wrists, and the Hands

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or Stiffness in the Arms, the Wrists, and the Hands	Yes	56(50.5)	55(49.5)	111(100.0)	73.852***
	No	11(6.3)	164(93.7)	175(100.0)	
Total		67(23.4)	219(76.6)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

Table 8. Experience of Inflation in the Lower Abdomen, Diarrhea, and Constipation

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience Inflation in the Lower Abdomen, Diarrhea, Constipation	Yes	79(54.1)	67(45.9)	146(100.0)	101.134***
	No	1(.7)	139(99.3)	140(100.0)	
Total		80(28.0)	206(72.0)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

Table 9. Experience of a Pain or Impaired Mobility in the Low Back

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or Impaired Mobility in the Low Back	Yes	100(43.5)	130(56.5)	230(100.0)	34.269***
	No	1(1.8)	55(98.2)	56(100.0)	
Total		101(35.3)	185(64.7)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

Table 10. Experience of a Pain or Impaired Mobility in the Hips.

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Pain or Impaired Mobility in the Hips	Yes	31(35.6)	56(64.4)	87(100.0)	75.180***
	No	1(.5)	198(99.5)	199(100.0)	
Total		32(11.2)	254(88.8)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

Table 11. Experience of a Sense of Numbness in the Legs

Pain Characteristics	Before Adjustment	After Adjustment		Total	χ^2
		Yes	No		
Whether to Experience a Sense of Numbness in the Legs	Yes	38(41.3)	54(58.7)	92(100.0)	80.326***
	No	3(1.5)	191(98.5)	194(100.0)	
Total		41(14.3)	245(85.7)	286(100.0)	

Chi-Square Test, *** $p < 0.001$.

4. Satisfaction After the Performance of Body Adjustment Therapy Based on Chiropractic

The study subjects' satisfaction with the chiropractic based body adjustment therapy after its performance is presented in Table 12. Regarding the question as to whether to experience side effects, 44 (15.4%) replied 'Yes' and 242 (84.6%) 'No'. With regard to their satisfaction with the therapy after body adjustment, 17 replied (5.9%) 'dissatisfied', and 269 (94.1%) 'satisfied'. Regarding the effects on body regions after the adjustment, 128 (44.8%) replied 'a lot of adjustment effects', and 12 (4.25 %) 'cured'. Regarding the question as to where there are daily life limits, 5 (1.7%) replied 'Yes', and 281 (98.3%) 'No'. With regard to the question as to whether they intend to recommend the adjustment therapy, 6 (2.1%) replied 'No' and 280 (97.95%) 'Yes'.

Table 12. Satisfaction after the Performance of Body Adjustment Therapy Based on Chiropractic

Satisfaction after the Performance of the Chiropractic Based Adjustment Therapy		n	%
Whether to Experience Side Effects	Yes	44	15.4
	No	242	84.6
Satisfied or Dissatisfied after the Adjustment	Dissatisfied	17	5.9
	Satisfied	269	94.1
Effects on the Body regions after the Adjustment	No effect	4	1.4
	Small Effects	142	49.7
	A lot of Effects	128	44.8
	Cured	12	4.2
Whether there are Daily Life Limits	Yes	5	1.7
	No	281	98.3
The Intention of Recommending the Adjustment Therapy	No	6	2.1
	Yes	280	97.9
Total		286	100.0

5. Comparison of Satisfaction After the Performance of the Body Adjustment Therapy Based on Chiropractic According to Types of Body Adjustment

1) Experience of Any Side Effects of the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

The study subjects' experience of any side effects after the performance of the chiropractic based body adjustment therapy is presented in Table 13. Regardless of the perceived body type, the reason of body adjustment, painful or abnormal body regions, the cause of pain and abnormality, and a period of perception, there are more subjects replying 'no experience of side effects'.

In particular, regarding the cause of pain and abnormality, 49 (89.1%) who replied 'occupation' and 163 (85.3%) who replied 'bad life habits' experienced far less side effects. Statistically, there were significant differences ($\chi^2=13.418$, $p<0.01$).

Table 13. Experience of Any Side Effects of the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

Types of Body Adjustment		Whether to Experience Side Effects		Total	χ^2
		Yes	No		
The Perceived Body Type	Obese Type	19(14.6)	111(85.4)	130(100.0)	0.657
	Standard Type	19(17.4)	90(82.6)	109(100.0)	
	Thin Type	6(12.8)	41(87.2)	47(100.0)	
Reason of Body Adjustment	Pain in a Particular Body Region	27(14.4)	161(85.6)	188(100.0)	0.441
	Unbalanced Left and Right Sides of the Body	17(17.3)	81(82.7)	98(100.0)	
Painful or Abnormal Body Region	Around the Head and the Neck	11(13.9)	68(86.1)	79(100.0)	2.816
	Around the Chest and the Back	3(15.0)	17(85.0)	20(100.0)	
	Around the Low Back	15(13.9)	93(86.1)	108(100.0)	
	Around the Shoulders and the Arms	5(15.6)	27(84.4)	32(100.0)	
	Around the Pelvis and the Legs	6(17.6)	28(82.4)	34(100.0)	
Cause of Pain and Abnormality	The Whole Body	4(30.8)	9(69.2)	13(100.0)	13.418**
	Bad Life Habits	27(14.2)	163(85.8)	190(100.0)	
	Occupation	6(10.9)	49(89.1)	55(100.0)	
	Obesity	1(33.3)	2(66.7)	3(100.0)	
	Feeble Constitution	3(75.0)	1(25.0)	4(100.0)	
A Period of Perception of Pain and Abnormality	Not Recognized	7(20.6)	27(79.4)	34(100.0)	4.864
	3 months	1(5.6)	17(94.4)	18(100.0)	
	6 months	5(27.8)	13(72.2)	18(100.0)	
	1 year	3(9.7)	28(90.3)	31(100.0)	
	2 years	6(20.7)	23(79.3)	29(100.0)	
Total		44(15.4)	242(84.6)	286(100.0)	

Chi-Square Test, ** $p < 0.01$.

2) Satisfaction with the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

The study subjects' satisfaction with the chiropractic based body adjustment therapy is

presented in Table 14. Regardless of the perceived body type, the reason of body adjustment, painful or abnormal body regions, the cause of pain and abnormality, and a period of perception, there was high satisfaction. And statistically, there was no significant difference.

Table 14. Satisfaction with Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

Types of Body Adjustment		Satisfaction after Adjustment		Total	χ^2
		Dissatisfied	Satisfied		
The Perceived Body Type	Obese Type	6(4.6)	124(95.4)	130(100.0)	2.301
	Standard Type	6(5.5)	103(94.5)	109(100.0)	
	Thin Type	5(10.6)	42(89.4)	47(100.0)	
Reason of Body Adjustment	Pain in a Particular Body Region	13(6.9)	175(93.1)	188(100.0)	0.925
	Unbalanced Left and Right Sides of the Body	4(4.1)	94(95.9)	98(100.0)	
Painful or Abnormal Body Region	Around the Head and the Neck	4(5.1)	75(94.9)	79(100.0)	5.124
	Around the Chest and the Back	-	20(100.0)	20(100.0)	
	Around the Low Back	8(7.4)	100(92.6)	108(100.0)	
	Around the Shoulders and the Arms	1(3.1)	31(96.9)	32(100.0)	
	Around the Pelvis and the Legs	4(11.8)	30(88.2)	34(100.0)	
Cause of Pain and Abnormality	The Whole Body	-	13(100.0)	13(100.0)	1.211
	Bad Life Habits	12(6.3)	178(93.7)	190(100.0)	
	Occupation	4(7.3)	51(92.7)	55(100.0)	
	Obesity	-	3(100.0)	3(100.0)	
	Feeble Constitution	-	4(100.0)	4(100.0)	
A Period of Perception of Pain and Abnormality	Not Recognized	1(2.9)	33(97.1)	34(100.0)	6.523
	3 months	2(11.1)	16(88.9)	18(100.0)	
	6 months	-	18(100.0)	18(100.0)	
	1 year	4(12.9)	27(87.1)	31(100.0)	
	2 years	-	29(100.0)	29(100.0)	
	3 years	11(5.8)	179(94.2)	190(100.0)	
Total		17(5.9)	269(94.1)	286(100.0)	

3) The Body Region Effects of the Chiropractic Based Body Adjustment Therapy
According to Types of Body Adjustment

The effects on body regions after the performance of the chiropractic based body adjustment therapy are presented in Table 15. Regardless of the perceived body type, the reason of body adjustment, painful or abnormal body regions, the cause of pain and abnormality, and a period of perception, the largest number of the study subjects replied 'some effects' and 'a lot of effects'.

In particular, in the case of painful and abnormal body regions, 12 studies (60.0%) who suffered a pain in the chest and the back replied 'a lot of effects'; 2 (15.4%) who had a pain in the whole body and 4 (11.8%) who had a pain in the pelvis and the legs replied 'cured'. Therefore, there were differences in satisfaction with the effect According to body regions ($\chi^2=26.394$, $p<0.05$).

Table 15. The Body Region Effects of the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

Types of Body Adjustment		Effects on Body Regions after Adjustment				Total	χ^2
		No effects	Some effects	A lot of effects	Cured		
The Perceived Body Type	Obese Type	2(1.5)	70(53.8)	53(40.8)	5(3.8)	130(100.0)	3.599
	Standard Type	1(.9)	52(47.7)	50(45.9)	6(5.5)	109(100.0)	
	Thin Type	1(2.1)	20(42.6)	25(53.2)	1(2.1)	47(100.0)	
Reason of Body Adjustment	Pain in a Particular Body Region	4(2.1)	88(46.8)	90(47.9)	6(3.2)	188(100.0)	5.488
	Unbalanced Left and Right Sides of the Body	-	54(55.1)	38(38.8)	6(6.1)	98(100.0)	
Painful or Abnormal Body Region	Around the Head and the Neck	1(1.3)	39(49.4)	38(48.1)	1(1.3)	79(100.0)	26.394*
	Around the Chest and the Back	1(5.0)	7(35.0)	12(60.0)	-	20(100.0)	
	Around the Low Back	2(1.9)	47(43.5)	54(50.0)	5(4.6)	108(100.0)	
	Around the Shoulders and	-	20(62.5)	12(37.5)	-	32(100.0)	

	the Arms						
	Around the Pelvis and the Legs	-	20(58.8)	10(29.4)	4(11.8)	34(100.0)	
	The Whole Body	-	9(69.2)	2(15.4)	2(15.4)	13(100.0)	
Cause of Pain and Abnormality	Bad Life Habits	3(1.6)	91(47.9)	89(46.8)	7(3.7)	190(100.0)	10.273
	Occupation	1(1.8)	27(49.1)	22(40.0)	5(9.1)	55(100.0)	
	Obesity	-	1(33.3)	2(66.7)	-	3(100.0)	
	Feeble Constitution	-	1(25.0)	3(75.0)	-	4(100.0)	
	Not Recognized	-	22(64.7)	12(35.3)	-	34(100.0)	
A period of Perception of Pain and Abnormality	3 months	-	11(61.1)	6(33.3)	1(5.6)	18(100.0)	8.505
	6 months	-	10(55.6)	7(38.9)	1(5.6)	18(100.0)	
	1 year	1(3.2)	18(58.1)	12(38.7)	-	31(100.0)	
	2 years	1(3.4)	17(58.6)	10(34.5)	1(3.4)	29(100.0)	
	3 years	2(1.1)	86(45.3)	93(48.9)	9(4.7)	190(100.0)	
Total		4(1.4)	142(49.7)	128(44.8)	12(4.2)	286(100.0)	

Chi-Square Test, * $p < 0.05$.

4) The Daily Life Limits after the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

The daily life limits after the chiropractic based body adjustment therapy are presented in Table 16. Regardless of the perceived body type, the reason of body adjustment, painful or abnormal body regions, the cause of pain and abnormality, and a period of perception, there were no limits in daily life. And statistically, there was no significant difference.

Table 16. The Daily Life Limits after the Chiropractic Based Body Adjustment Therapy

Types of Body Adjustment	Whether to have Limits in Daily Life		Total	χ^2	
	Yes	No			
The Perceived Body Type	Obese Type	4(3.1)	126(96.9)	130(100.0)	2.610
	Standard Type	1(.9)	108(99.1)	109(100.0)	
	Thin Type	-	47(100.0)	47(100.0)	
Reason of Body	Pain in a Particular Body	4(2.1)	184(97.9)	188(100.0)	0.460

Adjustment	Region				
	Unbalanced Left and Right Sides of the Body				
Painful or Abnormal Body Region	Around the Head and the Neck	-	79(100.0)	79(100.0)	3.510
	Around the Chest and the Back	1(5.0)	19(95.0)	20(100.0)	
	Around the Low Back	2(1.9)	106(98.1)	108(100.0)	
	Around the Shoulders and the Arms	1(3.1)	31(96.9)	32(100.0)	
	Around the Pelvis and the Legs	1(2.9)	33(97.1)	34(100.0)	
	The Whole Body	-	13(100.0)	13(100.0)	
Cause of Pain and Abnormality	Bad Life Habits	4(2.1)	186(97.9)	190(100.0)	1.526
	Occupation	-	55(100.0)	55(100.0)	
	Obesity	-	3(100.0)	3(100.0)	
	Feeble Constitution	-	4(100.0)	4(100.0)	
	Not Recognized	1(2.9)	33(97.1)	34(100.0)	
A Period of Perception of Pain and Abnormality	3 months	-	18(100.0)	18(100.0)	1.821
	6 months	-	18(100.0)	18(100.0)	
	1 year	-	31(100.0)	31(100.0)	
	2 years	1(3.4)	28(96.6)	29(100.0)	
	3 years	4(2.1)	186(97.9)	190(100.0)	
Total		5(1.7)	281(98.3)	286(100.0)	

5) The Recommendation Intention after the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

The recommendation intention after the chiropractic based body adjustment therapy is presented in Table 17. Regardless of the perceived body type, the reason of body adjustment, painful or abnormal body regions, the cause of pain and abnormality, and a period of perception, there was high recommendation intention. And statistically there was no significant difference.

Table 17. he Recommendation Intention after the Chiropractic Based Body Adjustment Therapy According to Types of Body Adjustment

Types of Body Adjustment		Whether to Intend to Recommend the Adjustment Therapy		Total	χ^2
		Yes	No		
The Perceived Body Type	Obese Type	126(96.9)	4(3.1)	130(100.0)	1.651
	Standard Type	107(98.2)	2(1.8)	109(100.0)	
	Thin Type	47(100.0)	-	47(100.0)	
Reason of Body Adjustment	Pain in a Particular Body Region	184(97.9)	4(2.1)	188(100.0)	0.002
	Unbalanced Left and Right Sides of the Body	96(98.0)	2(2.0)	98(100.0)	
Painful or Abnormal Body Region	Around the Head and the Neck	77(97.5)	2(2.5)	79(100.0)	4.037
	Around the Chest and the Back	20(100.0)	-	20(100.0)	
	Around the Low Back	107(99.1)	1(.9)	108(100.0)	
	Around the Shoulders and the Arms	31(96.9)	1(3.1)	32(100.0)	
	Around the Pelvis and the Legs	32(94.1)	2(5.9)	34(100.0)	
	The Whole Body	13(100.0)	-	13(100.0)	
Cause of Pain and Abnormality	Bad Life Habits	186(97.9)	4(2.1)	190(100.0)	0.289
	Occupations	54(98.2)	1(1.8)	55(100.0)	
	Obesity	3(100.0)	-	3(100.0)	
	Feeble Constitution	4(100.0)	-	4(100.0)	
	Not Recognized	33(97.1)	1(2.9)	34(100.0)	
A Period of Perception of Pain and Abnormality	3 months	18(100.0)	-	18(100.0)	5.888
	6 months	17(94.4)	1(5.6)	18(100.0)	
	1 year	30(96.8)	1(3.2)	31(100.0)	
	2 years	27(93.1)	2(6.9)	29(100.0)	
	3 years	188(98.9)	2(1.1)	190(100.0)	
Total		280(97.9)	6(2.1)	286(100.0)	

V. Discussion

A right posture helps spinal bones to get aligned well for the best adaptation to the loads imposed on the spine. Human postures are influenced by diseases, life habits, and dietary life and give direct and indirect influence on the growth and development of the body, health, work ability, and motion ability (Jang, 2010).

These days, various age groups ranging from young people, to students, and the elderly, who suffer unbalanced body, are on the rise. The imbalance of the body is not only related to external beauty, but closely related to physical and psychological health of the human body (Cailliet, 1990; Lee, 2004).

To balance the body, motion based therapies, medical therapies, and other therapies using tools are used. Among them, chiropractic is a therapy to adjust the displaced spine and pelvis. Domestically, although it has yet to be accepted from the medical perspective, more patients take the therapy.

According to Gu (2013) who researched posture balance and plantar pressure balance, the chiropractic based adjustment of the cervical vertebrae, the thoracic vertebrae, and the pelvis was effective in balancing the left and right sides of the body. The study by Market et al. (2004) also revealed that when scoliosis patients received spinal manipulation treatment and rehabilitation treatment, their Cobbangle and body balance were improved significantly.

In the study on scoliosis by Timgren & Soinila (2006), when scoliosis patients, 87% of whom had S-type or C-type scoliosis and definite imbalance of the left and right sides of the pelvis, received the chiropractic based adjustment treatment, their unbalanced pelvis were improved. Therefore, it was reported that the chiropractic therapy affected improvements in functional ability and pain alleviation. Also, according to the questionnaire survey with scoliosis patients, 78% of the patients showed improvements

in functional ability and pain alleviation.

Domestically, Jeong et al. (2005) researched the effects of the chiropractic based spinal adjustment on a range of lumbar extension and flexion motion. 30 patients (female: 16, male: 14) aged 20-50 who suffered a pain in the lumbar and had a reduced lumbar motion range had operations four times for three months. After that, their exercise range change was investigated. As a result, through motion palpation, it was possible to adjust reduced lumbar with chiropractic diversified technique. An inclinometer was used to measure the extension and flexion range of the twelfth thoracic vertebra and the link part of the sacral vertebrae. As a result, after the chiropractic operation, the motion range of extension and flexion was largely improved. Yang (2008) classified the patients who had the chronic low back pain and had problem with the lumbar joint motion range into a chiropractic group and a comparison group to research how the chiropractic based spinal adjustment would affect the motion range of the lumbar extension and flexion. As a result, its questionnaire survey revealed that the chiropractic therapy for the patients with the chronic low back pain was effective in improving their pain, and extension and flexion motions. As such, this study also showed that the study subjects' pains were alleviated more after the chiropractic based adjustment than before the adjustment.

Leboeuf et al. (2005) applied chiropractic to 5607 patients in the world. According to the result of non-musculoskeletal system reaction, 3~27% of the patients showed improvements in allergy, asthma, respiration, circulation, digestion, hearing, cardiac function, tinnitus, sinusitis, and urination. In particular, there were high improvements in respiration and indigestion. Tuchi et al. (2000) announced that chiropractic treatment was effective for migraine. This study also showed that the study subjects, who experienced headache, migraine, a pain or stiffness in the neck, and pains and impaired mobility in the chest, the back, the low back, and the hips, and a sense of numbness in the legs, had pain alleviation after the chiropractic based body adjustment. Therefore, it was

found that chiropractic treatment not only affected physical conditions related to stress, but also alleviation of disease symptoms felt subjectively.

In spite of high attention on chiropractic, it has yet to be defined as an alternative therapy in Korea. For the reason, many people raise the question of its stability and effectiveness.

Therefore, it will be necessary to suggest many clinical results and operation results in order to develop scientific and systematic chiropractic manuals and sustainable care programs.

VI. Conclusion

This study had conducted a questionnaire survey with 337 patients, who experienced chiropractic treatment for the body adjustment in a hospital in 00, Japan, in order to look into the effects of the treatment and their satisfaction with the effects of the body adjustment therapy. It came to the following conclusion.

1. The largest number of patients who received the chiropractic based body adjustment were those who were obese type in terms of the perceived body type, suffered a pain in a particular body region, and had a pain or abnormal symptoms in the low back. Bad life habits were the main cause of pain or abnormality. Regarding a period of perception of the symptoms, those who perceived them more than three years were the largest.
2. The study subjects who experienced headache, migraine, a pain or stiffness in the neck, and pains and impaired mobility in the chest, the back, the low back, and the hips, and a sense of numbness in the legs, had pain alleviation after the chiropractic based body adjustment ($p<0.001$).
3. The study subjects' experience of side effects of the chiropractic based body adjustment was low, and their satisfaction after the adjustment was very high. Regarding the effects of the adjustment on body regions, the largest number of respondents said that they had some or many effects, and some patients were cured after the adjustment. Their limits in daily life after the adjustment were low, and their intend of recommending the adjustment therapy was very high.
4. The study subjects' satisfaction after the chiropractic based body adjustment therapy according to types of body adjustment was different depending on the cause of pain and abnormality ($p<0.01$); their satisfaction with the effects on body regions was

different depending on painful or abnormal body regions ($p<0.05$).

Given the results of this study, pains were alleviated more after the chiropractic based body adjustment treatment than before the treatment, and satisfaction and the intention of recommending the adjustment treatment were very high.

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국문초록

본 연구는 카이로프랙틱 요법을 이용한 신체 교정 치료를 받은 환자 337명을 대상으로 신체 교정 효과에 대한 치료 전후의 통증 경험 유무 및, 만족도조사를 통계 분석하였다.

그 결과 카이로프랙틱을 이용한 신체 교정 후에 두통 편두통, 목, 가슴, 등, 허리, 엉덩이, 다리 등 신체 부위의 통증이 완화된 것으로 나타났으며 ($p<0.001$), 신체 교정 후 부작용은 낮고 만족도는 매우 높은 것으로 나타났다. 교정 치료 후 주변이네 대하여 카이로프랙틱 추천 의향이 매우 높은 것으로 파악되었다.

Key Words: 신체교정, 카이로프랙틱, 만족도, 추천의향

Appendix

Questionnaire

ID

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Dear participants,

The purpose of this questionnaire is to look into the patients' satisfaction with the body adjustment effect of chiropractic, and conduct a statistical analysis of fundamental materials.

This questionnaire may take some time. Please answer sincerely. This questionnaire survey is used only for statistics and guarantees your privacy. Please fill in the questionnaire honestly.

Thank you.

Jan. 2013

I . Types of body adjustment

1. What kind of body type do you think you have?

- ① Obese in the whole body ② Obese ③ Somewhat obese
④ Standard ⑤ Thin

2. Why did you make the body adjustment based on chiropractic?(choose one)

- ① Because of the pain in a particular body region
② Because of the unbalanced left and right sides of the body which needs posture adjustment

2-1. Based on your answer to the question 2, what is your body region(s) that you suffer most or have something abnormal in?

- ① Around the head and the neck ② Around the chest and the back
③ Around the low back ④ Around the shoulders and the arms
⑤ The pelvis and the legs ⑥ The whole body

3. What do you think is the cause of your abnormal body symptom or posture imbalance?

- ① Bad life habits ② Occupation ③ Obesity
 ④ Feeble constitution ⑤ Failed to recognize

4. Approximately, how long has you perceived your abnormal body symptom or posture imbalance?

- ① 3 months ② 6 months ③ 1 year ④ 2 years ⑤ 3 years

5. Please answer the questions of pain characteristics before and after the chiropractic based body adjustment.

Pain characteristics before and after the chiropractic based body adjustment.	Before the body adjustment		After the body adjustment	
	Yes	No	Yes	No
Have you ever experienced headache and migraine?				
Have you ever had such symptoms as a pain and stiffness in the neck region?				
Have you ever had such symptoms as a pain and a pressure(like indigestion) in the chest or in the back?				
Have you ever had such symptoms as a pain and a pressure in the shoulders?				
Have you ever had such symptoms as a pain and stiffness in the arms, the elbows, and the wrists?				
Have you ever experienced inflation in the lower abdomen, diarrhea, and constipation?				
Have you ever experienced a pain and impaired mobility in the low back ?				
Have you ever experienced a pain and impaired mobility in the hips?				
Have you ever experienced a sense of numbness in the legs(radiating pain in the lower legs)?				

II. Satisfaction after the performance of chiropractic body adjustment therapy

1. Have you ever experienced any side effects of chiropractic adjustment?

- ① A lot ② Somewhat ③ Limited ④ Seem not to ⑤ Never

2. How much are you satisfied with chiropractic adjustment?

- ① Very dissatisfied ② Dissatisfied ③ Neither satisfied nor dissatisfied
④ Satisfied ⑤ Very satisfied

3. How is the effect of the chiropractic adjustment on your spinal disorders and other body pains?()

- ① Worsening symptoms ② No effect ③ Seem to have the adjustment effect
④ A lot of effects of the adjustment ⑤ Cured after the adjustment.

4. How is your daily life after chiropractic adjustment therapy?

- ① Very discomfort ② discomfort ③ Better but sometimes discomfort
④ Normal life ⑤ Very normal

5. Will you take chiropractic adjustment therapy again if a spinal disorder occurs?(

- ① Never ② I will think about it ③ Somewhat ④ I will ⑤ Very

III. General characteristics

1. What is your gender? ① Male ② Female

2. How old are your? () years of age

3. Height(cm), Weight (kg)

4. Are you married or unmarried?

- ① unmarried(e.g., divorce, bereavement) ② married